

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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NINETEEN APPARENTLY NEW GRIZZLY AND BROWN  
BEARS FROM WESTERN AMERICA.

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During the two years that have elapsed since the publication of my last descriptions of big bears,\* a special effort has been made to obtain additional material, particularly from British Columbia, Yukon Territory, and Alaska. This effort has been more successful than expected, resulting in the acquisition of nearly 150 skulls. A critical study of these in connection with those previously examined, shows the existence of a number of additional forms and seems to prove conclusively that the Big Bears, like the smaller mammals, split up into an unexpectedly large number of species and subspecies.

The most surprising result is the discovery that Admiralty Island in southeastern Alaska appears to be inhabited by no less than five distinct species of bears, each of which is obviously related to and representative of an adjacent mainland species. The recognition of this very remarkable state of affairs makes it possible to clear up what before had seemed a most anomalous condition—namely, the extraordinary diversity or variability in the skulls and teeth of the island bears. It was not until the material essential for the determination of the mainland forms had been collected, that it was possible to properly recognize the island forms.

It is interesting to observe that in the case of the Admiralty Island Grizzly (*insularis*) the closest relationship appears to be with the geographically more remote Chichagof Island species (*eltonclarki*) rather than with the mainland *orgilos*. The infer-

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\* Descriptions of Thirty Apparently new Grizzly and Brown Bears from North America, Proc. Biol. Soc. Washington, XXVII, 173-196, August 13, 1914.

ence is, not that the Admiralty Grizzly is derived from the Chichagof Island species, but that the Chichagof Island form is a descendant of the ancestor of the one from Admiralty Island.

The varying degrees of divergence of the island forms furnish an interesting index to the relative time when each obtained a foothold on the island. In this connection it is well to bear in mind that the breadth of the strait separating Admiralty Island from the mainland is at its narrowest point not more than five miles.

The mainland Big Bears with their representatives on Admiralty Island here provisionally recognized are:

Mainland species	Admiralty Island species
<i>Ursus dalli</i>	<i>Ursus shirasi</i>
<i>stikeenensis</i>	<i>mirabilis</i>
<i>orgilos</i>	<i>insularis</i>
<i>kwakiutl</i>	<i>neglectus</i>
<i>caurinus</i>	<i>culophus</i>

Descriptions of the heretofore undescribed bears follow:

***Ursus apache* sp. nov.**

*Type* No. 212436 ♂ adult, U. S. National Museum, Biological Survey Collection. Killed on Whorton Creek on south slope of White Mts., eastern Arizona (a few miles west of Blue), April 3, 1913, by B. V. Lilly.

*Cranial characters*.—*Skull of adult male* (the type): Short, broad, and low, rather massive, moderately dished, with broad frontal shield and exceedingly broad outstanding postorbitals. Frontal shield broad, shallowly sulcate medially between orbits; very slightly and rather flatly swollen over orbits; long-pointed posteriorly, meeting short sagittal crest at fronto-parietal suture; rostrum short, high, and rather narrow; *zygomata strongly outbowed and outstanding anteriorly as well as posteriorly*; ramus of jaw rather short, bellied under last molars; coronoid blade high, sloping strongly outward, the apex overarching shallow coronoid notch, but not cutting plane of condyle; dentition moderate.

*Cranial comparisons*.—*Old male apache compared with male adult absarokus*, apparently its nearest relative, the skull of *apache* differs as follows: vault of cranium lower, less arched; frontal shield broader and flatter; postorbitals much broader and flatter, standing out more horizontally; naso-frontal region more depressed; rostrum shorter; *orbits notably smaller* (lower vertically); squamosal trough shorter anteroposteriorly; *zygomata very much more strongly outbowed and conspicuously more outstanding anteriorly*; lower jaw and inferior border of ramus shorter; coronoid blade of equal height; teeth slightly smaller (difference slight).

*Old male apache* (the type) compared with *adult male arizonae* (the type): Basal length, occipito-nasal length, length of palate, interorbital breadth, and occipito-sphenoid length essentially same; zygomata very much more outstanding and bowed instead of subtriangular; frontal shield less flat, of essentially same breadth as in *arizonae* interorbitally but very much wider across postorbital processes rising strongly from plane of rostrum; postorbital processes much more broadly outstanding; orbital rims more swollen; fronto-nasal region much less elevated; rostrum much smaller, narrower, less swollen, depressed basally, and horizontal instead of tapering; palate and postpalatal shelf much narrower. Lower jaw stronger; ramus broader vertically; coronoid blade higher; molars slightly smaller; heel of M<sup>2</sup> shorter, less distinctly emarginate on outer side (more tapering).

*Skull measurements* (♂ ad. type).—Basal length 325 mm.; occipito-nasal length 315; palatal length 171.5; zygomatic breadth 234; interorbital breadth 89.

#### ***Ursus arizonae* sp. nov.**

*Type* No. 177332 ♂ adult, east side Escudilla Mts., Apache Co., Arizona, September 3, 1911. C. H. Shinn.

*Cranial characters*.—*Skull of adult male* (the type): Size rather large; skull as a whole rather long and narrow, with broad rostrum; vault of cranium moderately elevated but not arched, highest about two-thirds distance from plane of postorbitals to fronto-parietal suture; frontal shield rather narrow, nearly flat, gently sloping in plane of rostrum, the posterior point in type specimen reaching to about 25 mm. in front of parietals [in older specimens shorter]; postorbitals broad and broadly rounded, nearly horizontal but not widely projecting; fronto-nasal region and rostrum elevated and swollen, continuing plane of frontal shield without trace of dishing, tapering anteriorly; zygomata not widely outstanding, bowed anterior roots swollen; palate rather short and broad; postpalatal shelf broad; meatus tube long; coronoid blade rather broad above, its recurved apex cutting plane of condyles. Teeth rather small for size of skull; canines of good size; molars rather small for size of skull, especially last upper molar.

*Cranial comparisons*.—*Adult male arizonae* (the type) compared with *old male apache* (the type): Basilar length, occipito-nasal length, length of palate, interorbital breadth, and occipito-sphenoid length essentially same; zygomata very much less outstanding and subtriangular instead of bowed; frontal shield flatter, of essentially same breadth interorbitally, but very much narrower across postorbital processes; postorbital processes much less broadly outstanding; orbital rims less swollen; fronto-nasal region much more elevated and swollen; rostrum much larger, broader, more swollen and tapering, instead of depressed basally, narrow and horizontal; palate and postpalatal shelf much broader. Lower jaw weaker; ramus less broad vertically; coronoid blade less high; molars slightly larger; heel of M<sup>2</sup> longer, more distinctly emarginate on outer side (less tapering).

*Skull measurements* (♂ ad. type).—Basal length 326 mm.; occipito-nasal length 323; palatal length 175; zygomatic breadth 208; interorbital breadth 82.

***Ursus chelan* sp. nov.**

*Type* No. 205185 ♂ old, U. S. National Museum, Biological Survey Collection. From east slope Cascade Mts., northern Chelan Co., Washington. (Killed in Township 30 N, Range 16 East, Willamette Meridian, Wenatche National Forest.) Collected September 1, 1913, by D. S. Rice, Forest Ranger.

*Cranial characters*.—External characters unknown. *Skull of old male* (the type): Size medium or rather large; facial axis strongly deflected from basicranial axis; vault of cranium well arched, highest over posterior frontal region; sagittal crest long, high, arcuate, rising anteriorly above general level of top of cranium. Affinities apparently with *selkirki* on the one hand, and with *shoshone* and *pervagor* on the other. Frontal shield narrow, flattened, short pointed posteriorly, ending about midway between fronto-parietal suture and plane of postorbitals, slightly sulcate medially; postorbital processes rather broad, flat, outstanding horizontally (not depressed or decurved); fronto-nasal region including posterior two-thirds of nasals sloping strongly, forming part of long fronto-facial plane; rostrum small, short, somewhat depressed, sloping anteriorly to nares, gradually rising posteriorly into frontal plane; braincase long, arched, frontal part keeled into sagittal crest; palate arched antero-posteriorly, slightly concave; postpalatal shelf broad; zygomata broadly spreading, rounded and outbowed posteriorly, vertically expanded and strongly arched; mastoids of medium length, spreading; lower jaw massive; ramus swollen on outer side over roots of 2d and 3d molars, bellied under last molars; coronoid blade high, its anterior border rather strongly recurved, the apex overarching high coronoid notch but barely reaching plane of front of condyle; teeth rather small for size of skull (so badly worn in type specimen that proportions of canines can not be determined).

*Cranial comparisons*.—Old male *Ursus chelan* differs from all its relatives in the degree of deflection of the facial part of the skull, and exceeds all except *selkirki* in the arching of the palate. *Type skull of chelan compared with the type skull of pervagor*: Basal length slightly less; zygomatic breadth greater; frontal shield shorter-pointed and flatter; postorbitals flatter and apparently broader; sagittal crest longer, higher anteriorly and more convex; rostrum shorter and more strongly sloping anteriorly; nares more truncate; zygomata more strongly outbowed, more arched, more expanded vertically, squamosal arm longer (squamoso-jugal suture much longer); palate shorter and more strongly arched; lower jaw shorter, its inferior ramus much shorter; coronoid blade slightly higher and more falcate. Some of these differences may be due to age, the skull of the type of *chelan* being very old, while the type of *pervagor* is only adult. However, the type of *chelan* differs rather conspicuously from an



equally old male *pervagor* from Bridge River (No. 4 Provincial Museum, Victoria, B. C.) as will be seen from the following: Basal length 20 mm. less; occipito-nasal length slightly greater; zygomatic breadth less; facial part strongly deflected [in *pervagor* not deflected]; palate arched [in *pervagor* not arched]; frontal shield shallowly sulcate medially [in old *pervagor* broadly concave]; postorbitals broad, flat, horizontally outstanding [in *pervagor* long, peglike, uplifted and arched]; braincase and sagittal crest arched [in *pervagor* straight and nearly horizontal]; occipital overhang much greater; zygomata less widely outbowed.

*Old male* (the type) compared with *old male selkirki* (the type, No. 205170) from upper Columbia River, Selkirk Mts., B. C.: Size larger (basal length only slightly greater but occipito-sphenoid and occipito-nasal lengths much greater, and skull as a whole distinctly larger); vault of cranium decidedly more highly arched; facial angle more strongly deflected from basi-cranial axis; zygomata much more widely spreading and outbowed, and much more arched; frontal shield rising less abruptly from rostrum, more evenly sloping, rising higher posteriorly, and much shorter-pointed; braincase and sagittal crest much longer, the crest higher and convex or arcuate anteriorly; occipital overhang greater; palate more strongly arched (anteroposteriorly); mastoids longer and strongly spreading. Lower jaw longer and more massive, more swollen on outer side below middle and posterior molars; its inferior border more bellied posteriorly; coronoid blade very much higher.

*Old male* (the type) compared with *old male washake* (the type): Size slightly larger (basal length essentially same but upper part of skull much longer); vault of cranium more highly arched; frontal shield continuing to rise posteriorly (instead of flattened) and much shorter-pointed; rostrum decidedly broader; postorbital processes not elevated; lachrymal duct within orbit (not cutting rim as seen from in front); braincase compressed and keeled anteriorly (in *washake* depressed); sagittal crest much longer and convex instead of straight; squamosal arm of zygoma longer and more broadly expanded vertically; palate concave and arched anteroposteriorly, instead of flat; postpalatal shelf longer and less broadly flattened; occipito-sphenoid longer; mastoids longer and more spreading. Molars smaller.

*Skull measurements* (♂ old, type).—Basal length 314 mm.; occipito-nasal length 323; palatal length 170; zygomatic breadth 225; interorbital breadth 86.

#### **Ursus cressonus** sp. nov.

*Type* No. 206529 ♂ old, U. S. National Museum, Biological Survey Collection. Type from Lakina River, south slope of Wrangell Range, Alaska. Collected by Captain J. P. Hubrick of McCarthy, Alaska, 1914.

*Range*.—Chitina River Valley and adjacent slopes of Skolai and Wrangell Mountains, westerly doubtless through Chugach Mountains to the west side of Cook Inlet, where it occurs as far south as the Iliamna region.

*Cranial characters.*—*Old male* (the type): Skull peculiar and distinctive; size large (basal length 357 mm.); skull long, narrow, high and strongly dishd; frontal shield highly elevated, rising abruptly from rostrum, rather broad, deeply sulcate throughout medially, swollen over orbits; short-pointed posteriorly; orbits nearly vertical; postorbital processes small and strongly decurved; fronto-nasal region sulcate and strongly dishd; rostrum rather short and narrow; nasals horizontal except posteriorly, where they rise strongly; braincase exceedingly long; sagittal crest high posteriorly, straight, and long, reaching anteriorly to halfway between parietals and plane of postorbitals; zygomatic arches moderately spreading, subtriangular (not outbowed), expanded vertically; palate and postpalatal shelf relatively long and narrow for so large a skull; postpalatal notch rather narrow and short; occipito-sphenoid long (about 103 mm.); mastoids outstanding; anterior nares rather small, subtruncate and broader than high in type skull, higher and less truncate in the Iliamna skulls. Lower jaw absent in type specimen. But in an old male from Iliamna, on north side of Cook Inlet (No. 209885) which closely matches the type, the ramus is broadly flattened vertically, much broader posteriorly than anteriorly; coronoid blade high and rather vertical. In younger skulls from Iliamna the coronoid is broader basally and less high. Canines large and massive; molars moderate; M<sup>2</sup> large in the type, smaller and more cut away on outer side of heel in the Iliamna specimens. No. 209885 from Iliamna agrees with the type except that the nares are higher and less truncate, and the last upper molar smaller, with heel more cut away on outer edge.

*Skull of old female* (No. 209881) from head of Chitina River (80 miles from McCarthy), Alaska, collected by Capt. J. P. Hubrick: Size medium; cranium moderately arched; frontal shield broad, deeply sulcate anteriorly, strongly swollen over and posterior to orbits, the point lyrate and reaching parietals; postorbitals rather large, blunt, and somewhat decurved; fronto-nasal region strongly dishd and depressed medially; rostrum rather large and high, nearly horizontal; palate and postpalatal shelf broad; postpalatal notch moderate and rather broad. Lower jaw long; coronoid blade high and rather narrow, its apex only slightly recurved. Dentition light; canines small and short; molars rather narrow, apparently normal (too badly worn to admit of description except that the heel of M<sup>2</sup> is moderately long and rather broadly rounded posteriorly).

*Cranial comparisons.*—*Old male cressonus* (type) compared with *old male dalli*: Size about same; vault of cranium and frontal shield much more elevated, less flat, less horizontal, and much more swollen over orbits; shield more deeply sulcate; postorbitals weak and decurved [in *dalli* larger and more horizontally outstanding]; fronto-nasal region more strongly dishd; rostrum narrower and longer; zygomata much less widely outstanding and much less bowed; palate longer; molars very much larger.

*Old male cressonus* (type) compared with *adult male nuchek* (type): Size, elevation of vault of cranium, and zygomatic breadth about same;

frontal shield somewhat broader, much more highly arched, much more swollen over orbits, much more deeply sulcate medially, shorter and more acutely pointed posteriorly; postorbitals smaller and more decurved; fronto-nasal region strongly dished; rostrum more depressed; nares more truncate; last upper molar of normal form, large, and with long posteriorly rounded heel, differing widely from the short, broad-in-the-middle, obliquely truncate tooth of *nuchek*.

*Skull measurements* (♂ old, type).—Basal length 357 mm.; occipito-nasal length 354; palatal length 199; zygomatic breadth 244; interorbital breadth 97.

#### ***Ursus eximius* sp. nov.**

*Type* No. 122495 ♂ adult, U. S. National Museum. From head of Knik Arm, Cook Inlet, Alaska. Received from G. W. Palmer in 1903 (killed by a native).

*Characters*.—Size rather large; color uniform rich dark brown, suggesting seal brown; muzzle brown, paler than rest of head; back of head and neck lightly sprinkled with pale-tipped hairs; claws of medium thickness, only slightly curved, decidedly short, probably from wear, smooth, very dark horn color, becoming paler on sides toward tip. Skull long and narrow, with narrow highly arched frontals. Related to *kidderi*.

*Cranial characters*.—*Adult male* (the type): Skull long, extremely narrow in fronto-nasal region, rather highly arched and strongly dished. Frontal shield exceedingly narrow, convex, shallowly sulcate medially, strongly arched anteriorly, horizontal posteriorly, long-pointed, the point nearly reaching fronto-parietal suture; postorbital processes slender, peg-like, moderately outstanding; naso-frontal region strongly dished; rostrum long, narrow, high, compressed between nasals and canine roots; zygomata moderately outstanding, subtriangular; palate long and narrow; postpalatal shelf relatively broad; notch rather broad; mastoids long, strongly divergent; underjaw long, moderately massive, the ramus broad vertically; coronoid blade rather broad, the apex not strongly recurved; teeth of medium size; M<sup>2</sup> with rather long heel, not much narrowed posteriorly; M<sup>1</sup> relatively large and broad; PM<sub>4</sub> a single cone without distinct heel but sulcate posteriorly.

*Adult female* (No. 205176) *from type locality*: Skull long and narrow; vault of cranium moderately arched, the highest part forming a hump at fronto-parietal suture; frontal shield narrow, flattish, sulcate medially, the point reaching fronto-parietal suture; postorbitals weak, subtriangular, not decurved; fronto-nasal region moderately dished; rostrum narrow, compressed between nasals and canine roots; zygomata moderately spreading, subtriangular; postpalatal shelf relatively broad; notch moderate; inferior border of ramus convex from plane of front molar posteriorly; coronoid blade broad and low.

*Cranial comparisons*.—*Ursus eximius* appears to be related to only a single species, *Ursus kidderi* of Alaska Peninsula. *Adult male* (No. 122495, the type) *from Knik Arm, compared with a series of kidderi* from

various points on Alaska Peninsula: Size about the same; vault of cranium more highly arched; frontal shield narrower, more strongly convex in cross section, less deeply sulcate; postpalatal processes more slender, peglike and outstanding; frontal-nasal region more dished; rostrum more slender; nasals more completely wedge-shape, longer posteriorly, reaching posteriorly to plane of postpalatal processes; mastoids longer and more divergent.

*Adult female* (No. 205176) from head of Knik Arm, compared with *adult female kidderi*: Size materially smaller; frontal shield and rostrum much narrower; vault of cranium notably higher over fronto-parietal suture; braincase narrower; nasals longer posteriorly; lower jaw smaller and lighter.

*Male adult eximius* (the type) compared with *male adult alascensis* (No. 76466) from Unalaklik River, Norton Sound, Alaska: Skull much longer, more highly arched, and narrower throughout. Frontal shield much more elevated, narrower, and longer posteriorly; fronto-nasal region more strongly dished; rostrum narrower and higher; lambdoid crest much more strongly developed; palate and post-palatal shelf much longer; occipito-sphenoid much longer; mastoids much longer and strongly divergent; lower jaw longer; coronoid blade much higher; teeth larger; heel of  $M^2$  much longer.

*Adult female eximius compared with female alascensis*: Length essentially same; skull narrower throughout; frontal shield lower, much narrower and flatter, rising less abruptly from rostrum; fronto-nasal region sulcate but less strongly dished; rostrum slightly more slender; postpalatal shelf narrower. Underjaw about same length; inferior border of ramus more evenly convex (less abruptly bellied); coronoid blade broader; canines about same size; molars somewhat larger.

*Skull measurements* ( $\sigma$  ad. type).—Basal length 331 mm.; occipito-nasal length 319; palatal length 185; zygomatic breadth 215; interorbital breadth 71.

#### ***Ursus hoots* \* sp. nov.**

*Type* No. 206136  $\sigma$  adult, U. S. National Museum, Biological Survey Collection. From Clearwater Creek, a north branch of Stikine River, B. C., 1913. Collected by John Hyland; presented by Lincoln Ellsworth.

*Cranial characters*.—Size medium inclining to large; skull massive, slightly dished, rather short, low, and flattish, very broad across frontals and rostrum. Frontal shield broad, nearly flat, long-pointed; broadly and shallowly sulcate medially as far back as posterior plane of post-orbitals; postorbitals large, broad, and horizontally outstanding; fronto-nasal region sloping; rostrum broad; palate and postpalatal shelf broad; postpalatal notch moderate; sagittal crest short, ending at fronto-parietal suture; zygomata moderately outbowed, not broadly spreading; lower jaw rather massive; inferior border of ramus upcurved posteriorly; coro-

\* *Hoots*, the native Indian name for the big brown and grizzly bears.

noid blade broad at base, curving strongly backward, the apex cutting plane of condyle; dentition remarkably light for so large a skull; canines and molars (both upper and lower) surprisingly small.

*Remarks.*—*Ursus hoots* is not related to any of the other mainland species so far as I am aware, but is related to *Ursus sitkensis* of Baranof and Chichagof Islands. It differs from *sitkensis* in somewhat smaller size; less elevated posterior frontal region; broader postorbital processes; less broadly spreading zygomata; shorter and less spreading mastoids; less vertical and more strongly recurved coronoid blade, the apex over-arching a well defined coronoid notch; smaller molars (both upper and lower) and smaller upper incisors. The large lower premolar has the upturned heel of the Sitka bear, but lacks the posterior sulcus and pair of cusplets of the grizzlies.

*Skull measurements* (♂ ad. type).—Basal length 333 mm.; occipito-nasal length 325; palatal length 179; zygomatic breadth 228; interorbital breadth 96.

***Ursus eltonclarki insularis* subsp. nov.**

ADMIRALTY ISLAND GRIZZLY.

*Type* from Admiralty Island, southeastern Alaska. No. 205186 ♂ old, U. S. National Museum, Biological Survey Collection, 1914. Purchased from W. H. Case of Juneau.

*Characters.*—A Grizzly closely related to *eltonclarki* and like it having the Grizzly type of pm<sub>4</sub> only faintly developed. External characters unknown.

*Cranial characters.*—Skull similar in general to that of *eltonclarki*, agreeing essentially in basilar length, zygomatic breadth, length and narrowness of palate and postpalatal shelf, and narrowness of postpalatal notch, but differing materially in breadth of frontal shield, size of postorbital processes, and proportions of teeth. Frontal shield much broader (interorbitally 82 mm. contrasted with 69 mm.), less flat, shallowly sulcate medially; postorbital processes very much larger, broader, more widely outstanding (distance across processes 120 mm. contrasted with 101 mm.) and more decurved; rostrum shorter; nasals shorter (89 mm. contrasted with 105 mm.—probably not constant). Lower jaw more massive; inferior border of ramus longer and more swollen; outer side of ramus not depressed or excavated below anterior base of coronoid; coronoid blade narrower and higher. Canines (both upper and lower) somewhat shorter; molars, especially M<sup>1</sup>, M<sub>1</sub> and M<sub>2</sub> decidedly larger.

*Skull measurements* (♂ old, type)—Basal length 311 mm.; occipito-nasal length 310; palatal length 171; zygomatic breadth 216; interorbital breadth 82.

***Ursus kluane* sp. nov.**

*Type* No. 204188 ♂ old, U. S. National Museum, Biological Survey Collection. From McConnell River, Yukon Territory, July 15, 1914. Collected by Smith and Geddis.



*Cranial characters.*—*Skull of adult male*: Size medium, rather long, narrow, somewhat arched and dished, with long braincase, long convex sagittal crest, and unusually broad decurved postorbitals. Frontal shield of medium width, strongly convex both transversely and anteroposteriorly, rising rather strongly from rostrum, slightly sulcate medially and moderately swollen over orbits; very short-pointed, the point ending about midway between parietals and plane of postorbitals; postorbitals remarkably broad, decurved, strongly convex anteriorly, concave posteriorly; fronto-nasal region somewhat depressed; rostrum high and narrow, rounded above (subterete); nares truncate; sagittal crest very long and arcuate; occipital overhang and inion well developed; zygomata not widely outstanding, somewhat bowed, rounded posteriorly; palate moderate, postpalatal shelf large and broad; notch rather broad and short; mastoids long and divergent; underjaw rather long; coronoid blade high and narrow, the apex rather strongly recurved; teeth too badly worn to admit of description (apparently large for size of skull).

*Skull of adult female*: Size small, nearly as small as female *pallasi*; fronto-nasal region moderately dished and usually sulcate; braincase moderately arched, highest just in front of fronto-parietal suture; temporal impressions meeting over anterior part of parietals (probably somewhat more anteriorly in old skulls); zygomata moderately outbowed, subtriangular; frontal shield of medium breadth, lyrate-pointed posteriorly; postorbital processes rather broad for so small a skull, moderately decurved; underjaw short; coronoid blade broad basally and rather short. Teeth (canines, incisors and molars) rather large for size of skull, decidedly larger than in *pallasi*; molars, both upper and lower, very much larger.

*Cranial comparisons.*—The only species requiring comparison with *kluane* are *toklat*, *latifrons* and *pallasi*. *Old male* (the type) compared with *old male toklat* from *Alaska Range*, near north base of Mt. McKinley: Size slightly larger; occipito-nasal length, length of braincase, and length of sagittal crest very much greater; frontal shield more convex transversely; postorbital processes much larger and broader; rostrum higher, more rounded on top; nares more squarely truncate; underjaw longer; inferior border of ramus more convex posteriorly; coronoid blade decidedly higher, narrower above, the apex more strongly recurved; teeth badly worn in both; but canines decidedly longer in *kluane*; molars apparently somewhat larger.

*Adult female kluane compared with adult female toklat* (comparison hardly necessary because of the great difference in size): Basal length at least 20 mm. less; vault of cranium and frontal shield lower; braincase less constricted anteriorly; posterior part of shield much longer and broader, reaching or passing the fronto-parietal suture; sagittal crest much shorter; postpalatal shelf less broad; lower jaw and inferior border of ramus shorter; coronoid blade about same height; canines about same size; molariform series (upper and lower) about same length but proportions of individual teeth differ:  $M^1$  much larger;  $M^2$  with shorter heel;  $M_1$  larger.

*Old male kluane compared with old male latifrons:* Size essentially same; frontal region much narrower and more highly arched; postorbital processes much broader and more strongly decurved; sagittal crest longer, arched instead of straight; rostrum more elevated and more rounded above; nasals convex instead of flat in cross section. Zygomata less widely outspreading and less bowed; coronoid blade narrower.

*Adult female kluane compared with adult female latifrons:* Skull much smaller, shorter, and more delicate. Frontal shield much narrower; vault of cranium more arched over posterior frontals; rostrum lower; zygomata less widely outstanding; palate much narrower; lower molars and canines approximately same size; last upper molar much smaller. While the skull of female *kluane* is much smaller than that of *latifrons*, the lower jaw is nearly the same size.

*Old male kluane (the type) compared with old male pallasi (the type):* Size decidedly greater; skull about an inch longer and much more highly arched, with conspicuously longer braincase and longer sagittal crest; crest strongly arched instead of nearly straight; postorbitals very much larger, broader, and more strongly decurved; fronto-nasal region much more elevated and less dished; rostrum much higher, rounded above instead of depressed; palate much longer, more arched and more concave; lower jaw much longer; coronoid higher.

*Adult female kluane compared with adult female pallasi:* Skulls very much alike in size and appearance (that of *kluane* slightly larger) but teeth strikingly different. In *kluane* canines larger; molars very much larger.

*Skull measurements* (♂ old, type).—Basal length 317 mm.; occipito-nasal length 324; palatal length 177; zygomatic breadth 210; interorbital breadth 85.

### **Ursus kwakiutl** sp. nov.

KWAKIUTL GRIZZLY.

*Type* No. 211748 ♂ adult, U. S. National Museum, Biological Survey Collection. From Jervis Inlet, coast of southern British Columbia. Collected May 17, 1916, by Fred Mansell.

*Range.*—Coast region of British Columbia from southwestern corner (Burrard Inlet, Howe Sound, Jervis Inlet) northwesterly to lower Skeena (Lakelse River).

*Characters.*—Size large; color dark; ears densely furred; claws unknown. Skull long, but little arched.

*Color.*—Skin of head of adult male (the type): Nose brown; head and face from front of eyes posteriorly very dark brown, darkest on ears, slightly grizzly on occiput by golden-tipped hairs.

*Cranial characters.*—Adult male (the type): Size large; skull long, rather low and narrow, with long high rostrum, gradually ascending frontal shield, rather low fronto-parietal region, and strongly outstanding postorbitals. Frontal shield of moderate breadth, shallowly sulcate medially, swollen over orbits, short-pointed posteriorly; rostrum long, high, and rather narrow; nasals flattened, nearly horizontal; fronto-

nasal region sloping gently in plane of shield; braincase long, its anterior part keeling into elongate sagittal crest; zygomata moderately spreading (becoming of course more strongly outbowed in old age); palate long, concave, slightly arched antero-posteriorly; postpalatal shelf large and broad, nearly square; dentition rather light for size of skull; underjaw long, its inferior border slightly sinuous (slightly bellied under last molars); coronoid blade broad at base, not very high, the apex slightly produced posteriorly but falling far short of plane of condyle. In old age, as shown by the Lakelse River skull, the frontal shield becomes more broadly and evenly concave, the posterior point even shorter, and the postorbital processes more elongate, peglike, and elevated.

*Cranial comparisons.*—The only described species requiring comparison with *kwakiutl* is the very different *pervagor* (type skulls, both males, of about same age). *Ursus kwakiutl* differs as follows: skull longer and less highly arched; braincase and rostrum materially longer; frontal shield posteriorly shorter-pointed; rostrum more elevated anteriorly, the nasals more horizontal; postpalatal notch longer; underjaw decidedly longer, but inferior border of ramus from symphysis to subangular tubercle of essentially same length; infra-angular border much longer. Dentition heavier (both upper and lower canines, incisors, and molars larger).

*Skull Measurements* (♂ ad. type).—Basal length 340 mm.; occipito-nasal length 330; palatal length 184; zygomatic breadth 212; interorbital breadth 85.

### ***Ursus kwakiutl neglectus* subsp. nov.**

ADMIRALTY KWAKIUTL GRIZZLY.

*Type* No. 209889 ♂ old, U. S. National Museum, Biological Survey Collection. From near Hawk Inlet, Admiralty Island, southeastern Alaska. Collected April, 1914, by W. H. Spaulding.

*Characters.*—Skull rather large and massive, flat-topped, with rather broad outstanding postorbitals. Frontal shield moderate, flattish, shallowly sulcate, rather short-pointed; fronto-nasal region elevated in plane of shield and slightly compressed; rostrum moderate, high; zygomata moderately outstanding and somewhat bowed; postpalatal shelf short and broad; notch rather broad. Underjaw rather short, ramus rather flat and broad vertically, especially posteriorly; strongly bellied posteriorly; coronoid blade high and narrow, its apex not reaching plane of condyle. Teeth moderate.

*Cranial comparisons.*—*Old male* (the type) compared with *adult and old male kwakiutl* from Jervis Inlet (the type) and Lakelse River (much older): Size smaller; postorbitals broader; shield more horizontal; fronto-nasal region elevated instead of depressed; zygomata less outbowed; nasals more produced anteriorly, projecting broadly over nares (about 7 mm. beyond premaxillae at point of contact; nares more truncate; underjaw much shorter; coronoid blade narrower. Upper canines and crown of last upper molar longer.

*Old male* (the type) compared with *old male warburtoni* from Atnarko and Iskoot Rivers and Chilkat Valley): Size decidedly smaller (but occipito-sphenoid length same); zygomata less outbowed; nasals more projecting anteriorly; palate shorter; postpalatal shelf broader, flatter and much shorter; mastoids shorter; underjaw slightly smaller; coronoid blade narrower and more vertical. Canines (especially upper) more slender; M<sup>2</sup> narrower and less massive.

*Skull measurements* (♂ old, type).—Basal length 322 mm.; occipito-nasal length 325; palatal length 177; zygomatic breadth 229; interorbital breadth 83.

***Ursus kwakiutl warburtoni* \* subsp. nov.**

WARBURTON PIKE GRIZZLY.

*Type* No. 210576 ♂ old, U. S. National Museum, Biological Survey Collection. From Atnarko River, B. C., July 15, 1915. E. H. Edwards.

*Range*.—Coast region of southeastern Alaska and adjacent parts of British Columbia from Chilkat River southeasterly to Atnarko River of the Bella Coola (Skulls of adult males examined from Atnarko River, Iskoot River near junction with Stikine, and Chilkat River Valley).

*Cranial characters*.—*Skull of adult males*: Large and massive, rather long and flattish on top—not arched. Similar to male *kwakiutl* but with much broader (less peglike) and flatter postorbitals, flatter frontal shield (not deeply concave in old age), much shorter sagittal crest, somewhat heavier dentition, especially broader and more massive M<sup>2</sup>. Easily distinguished from *stikeenensis* of the same region by the much greater length of skull and lower jaw and lesser elevation of frontal region.

*Skull measurements* (♂ old, type).—Basal length 340 mm.; occipito-nasal length 324; palatal length 185; zygomatic breadth 233; interorbital breadth 85.

***Ursus mendocinensis* sp. nov.**

*Type* from near Long Valley, Mendocino Co., Calif., No. 206625 ♂ old, U. S. National Museum, Biological Survey Collection. Obtained through Charles J. and Frank H. Hittell.

*Characters*.—Size rather large, about equalling *klamathensis* but apparently less than *californicus* and *colusus*; external characters unknown. Affinities with *klamathensis*, with which it may intergrade at the north.

*Cranial characters*.—Skull short, broad, highly arched and strongly dished, with widely outstanding zygomata and truncate occiput. Frontal shield of moderate breadth, short-pointed posteriorly, slightly convex between orbits, strongly sloping to rostrum; rostrum short, broad, and strongly depressed; postorbital processes moderate, sub-peglike, horizontally outstanding; sagittal crest high, thick, humped anteriorly, short posteriorly; occiput obliquely truncate; occipital overhang slight com-

\* Named in honor of the late Warburton Pike, author of *The Barren Grounds of Northern Canada* and *The Subarctic Forest*, who obtained a fine large typical skull on the Iskoot, a few miles from its junction with the Stikine (No. 9 Provincial Museum, Victoria, B. C.).

pared with that of *californicus* and *colusus*; palate short and rather broad; postpalatal shelf of moderate breadth, flat; postpalatal notch moderate; mastoids rather short, directed anteriorly. Lower jaw absent. Teeth gone except left hind molar, which is short, heel small, obliquely truncate on outer side (as in *klamathensis*).

*Cranial comparisons.*—Similar in general to *klamathensis* but fronto-nasal region strongly dished, *rostrum shorter, broader, flatter on top, and depressed instead of elevated*; zygomata more widely outstanding; palate broader; occipital overhang less.

*Skull measurements* (♂ old, type).—Basal length 327 mm.; occipito-nasal length 323; palatal length 183; interorbital breadth 84.5.

#### ***Ursus mirabilis* sp. nov.**

*Type* No. 137471 ♂ adult, U. S. National Museum, Biological Survey Collection. From Admiralty Island, Alaska. Collected June 26, 1905, by Cyrus Catt.

*Characters.*—A true Grizzly, of medium size, related to *stikeenensis* of the mainland, and having the same high bulging forehead; external characters unknown.

*Cranial characters.*—*Adult male* (the type): Skull of medium size, short, with rather broadly spreading zygomata and highly arched (almost domed) frontal region. Frontal shield of moderate breadth, short-pointed posteriorly, rising abruptly from rostrum, convex both anteroposteriorly and transversely, slightly sulcate medially, moderately swollen on each side of sulcus; postorbital processes moderate, broader than peglike, slightly decurved (continuing convexity of frontals); fronto-nasal region strongly dished; rostrum high, narrow, strongly sloping; zygomata rather broadly outstanding, slightly bowed; palate and postpalatal shelf rather broad; underjaw short; ramus bellied posteriorly; coronoid blade high and rather vertical, the apex not reaching plane of condyle. Upper canines rather long; molars rather broad and short.

*Cranial comparisons.*—*Ursus mirabilis* requires comparison with only a single species—*stikeenensis* of the neighboring mainland. Compared with *stikeenensis*: Size smaller; frontal shield narrower and more bulging anteriorly, rising more abruptly from rostrum; rostrum narrower, materially higher, and more sloping; zygomata more widely outstanding; occipital overhang more pronounced; palate and postpalatal shelf similar; lower jaw less massive; coronoid blade narrower and higher. Teeth similar but heel of last upper molar much shorter.

*Skull measurements* (♂ ad. type).—Basal length 308 mm.; occipito-nasal length 310; palatal length 168; zygomatic breadth 230; interorbital breadth 81.

#### ***Ursus nuchek* sp. nov.**

*Type* No. 146459 ♂ old, U. S. National Museum, Biological Survey Collection. Type from head of Nuchek Bay, Hinchinbrook Island, Prince William Sound, Alaska. Collected Sept. 15, 1905, by C. Swan-son.



*Range*.—Prince William Sound easterly to Mt. St. Elias; limits unknown.

*Characters*.—Size large; external characters unknown; skull long, narrow, and moderately high; molars peculiar.

*Cranial characters*.—*Skull of adult male* (the type): Large, elongate; frontal shield relatively narrow, flattish, moderately depressed between orbits; orbital rims thickened; postorbital processes broad and flattish, moderately outstanding; posterior part of shield broad, ending about two-thirds distance from plane of postorbitals to fronto-parietal suture; sagittal crest rather long, straight, high posteriorly; rostrum long, high, rather narrow; fronto-nasal region sloping in facial plane; nasals slightly elevated anteriorly; zygomata moderately spreading, subtriangular, not much expanded vertically; postpalatal shelf moderate, its sides rounded; notch long and narrow; anterior nares small; meatus tube short and large. Lower jaw massive; coronoid blade narrow and falcate. Teeth of medium size; molars broad (more massive than in *dalli*); last upper molar exceptionally short, broadest in middle, heel short and obliquely truncate on outer side; M<sup>1</sup> large, much broader posteriorly than anteriorly; middle lower molar peculiar: twin cusps of entoconid very small, low, and close together; main cusp of inner side large and high, reducing the posterior moiety of the tooth to about one-third length of crown instead of about one-half as usual.

*Skull of yg-ad. female* (No. 44049) from Chaix Hills near Mt. St. Elias, Alaska, killed July 4, 1891, by the late Prof. I. C. Russell. Skull long, narrow, rather low, with narrow frontals, narrow rostrum, and moderately outstanding subtriangular zygomata. Frontal shield flattish, medially depressed interorbitally, sloping gradually into rostrum, rather short-pointed posteriorly (ending about 15 mm. in front of parietals; in fully adult and old females it would be still shorter); postorbital processes moderate, horizontally outstanding, the tips rounded (not fully grown); palate concave, postpalatal shelf rather long and broad; notch rather narrow; basisphenoid strongly concave anteroposteriorly and transversely; lower jaw long and slender. Canines long and slender; molars and large premolars with rather high cusps; last upper molar short, much broader in middle than anteriorly, heel short and obliquely truncate on outer side.

*Cranial comparisons*.—*Ursus nuchek* evidently overlaps the range of *dalli* and may come in contact with *ressonus*, necessitating comparisons with both.

*Adult male nuchek* (the type) compared with adult and old male *dalli* (Nos. 75047 and 210293): Size about same; basal length essentially same, but occipito-nasal length decidedly greater; skull appearing longer and narrower; more elevated behind orbits and much more strongly sloping posteriorly; frontal shield narrower, the point broader posteriorly; vault of cranium higher and less horizontal; postorbitals less outstanding; fronto-nasal region less dished; rostrum longer and not depressed (appearing narrower); zygomata less outbowed (more triangular); palate somewhat longer; postpalatal notch longer and narrower; mastoids less

appressed, leaving wide post-glenoid space with correspondingly large open meatus [in *dalli* closer to glenoid process, pressing on and contracting meatus tubes]; coronoid blade narrower above (more falcate). Canines about the same; molars both upper and lower decidedly larger and more massive and in details quite different: M<sup>2</sup> exceptionally short and much broader in middle than elsewhere, heel short and obliquely truncate on outer side; M<sup>1</sup> large, much broader posteriorly than anteriorly; middle lower molar peculiar, the twin cusps of entoconid very small, low, and close together; metaconid exceptionally large and high, reducing the posterior moiety of the crown to about one-third its length, instead of about half as in *dalli* and most species.

*Young-adult female nuchek* (No. 44049) from near Mt. St. Elias compared with *female dalli* (No. 140085) from Copper River Delta: Skulls so strikingly different as not to require close comparison, that of *nuchek* being light, slender, narrow, with low narrow flattened frontal region, long slender rostrum, and light underjaw, while that of *female dalli* is massive, broadly arched or domed, and with massive underjaw. The teeth also differ strikingly.

*Yg. adult female nuchek* (No. 44049) contrasted with *old female cressonus* (No. 209881): Size slightly smaller (when fully adult probably same); frontal shield much narrower and flatter, much less deeply sulcate, much less swollen over orbits, and much shorter posteriorly; fronto-nasal region in same plane (in ♀ *cressonus* strongly dished); sagittal crest longer; nares smaller; canines (upper and lower) much longer; molars more massive; M<sup>2</sup> extremely short, much broadest in middle, with short obliquely truncate heel (in *cressonus* normal).

*Female nuchek* (No. 44049) compared with *female kenaiensis* (No. 133244): Basal length essentially same; cranium narrower with narrower braincase, narrower shield, and narrower rostrum; zygomata less broadly spreading (would be more broadly spreading with age); occipito-sphenoid shorter; palate essentially same length but narrower; postpalatal shelf narrower; ramus more slender (conspicuously thinner below M<sub>2</sub> and M<sub>3</sub>); its inferior border straighter, less upcurved posteriorly; coronoid lower and less narrowed above; cusps of large premolars above and below much more highly developed; main cusp of upper premolars very much higher relative to posterior cusp; molar cusps also more strongly developed; last upper molar shorter and of peculiar form as in the male.

*Skull measurements* (♂ old, type).—Basal length 360 mm.;\* occipito-nasal length 358; palatal length 191; zygomatic breadth 248; interorbital breadth 88.

#### ***Ursus ophrus* † sp. nov.**

*Type* No. 210252 ♂ old, U. S. National Museum, Biological Survey Collection. Type from eastern British Columbia (exact locality unknown). Collected in 1915 by E. W. Darbey.

*Cranial characters*.—*Skull of adult male* short, strongly dished, remark-

\* Estimated.

† *Ophrus* with reference to the unusual brows.

ably high, the deeply sulcate frontal shield rising abruptly high over orbits, with thickened brows and large outstanding arched postorbital processes. Frontal shield of moderate breadth; deeply and broadly concave between orbits, swollen over orbits and passing out into strongly outstanding postorbitals, short-pointed posteriorly; naso-frontal region deeply sulcate; middle part of nasals flat; sagittal crest high and reaching anteriorly nearly midway from fronto-parietal suture to plane of postorbitals; rostrum rather small and narrow; palate rather narrow; postpalatal shelf rather broad; zygomata broadly and strongly outbowed; mastoids rather long; underjaw long, its inferior margin rather long and nearly straight; subangular tubercle considerably posterior to mental foramen; coronoid blade broad, its apex only moderately recurved, ending anteriorly to plane of condyle; canines of medium size, the lower ones rather massive; molars of medium size, the upper rather small for size of skull.

*Skull of adult female* (No. 75613 rather old) from Henry House, Alberta, Sept. 27, 1895, J. Alden Loring: Similar in general to skull of male with the usual sexual differences, but frontals much less elevated; top of skull rather low and flattish; frontal shield of moderate breadth, broadly depressed interorbitally, the point long and lyrate; naso-frontal region sulcate and strongly dished; postorbital processes large, elevated, and horizontally outstanding; sagittal crest short, covering only posterior half of parietal suture; braincase short and swollen; postpalatal shelf rather broad; zygomata moderately spreading, subtriangular, anterior roots somewhat swollen.

*Skull measurements* (♂ old, type).—Basal length 323 mm.;\* occipito-nasal length 304; palatal length 175; zygomatic breadth 229; interorbital breadth 85.

#### ***Ursus pallasi* sp. nov.**

*Type* No. 205160 ♂ old, U. S. National Museum, Biological Survey Collection. From Donjek River, southwestern Yukon Territory. Collected August, 1913, by T. A. Dixon.

*Cranial characters*.—*Skull of old male* (the type): Size small, one of the smallest of the grizzlies; skull moderately elevated, flattish on top, with relatively broad frontal shield. Frontal shield flattish, exceedingly short-pointed posteriorly, faintly depressed medially between orbits, slightly swollen on sides of median depression, strongly sloping to rostrum; postorbital processes small, peglike, horizontally outstanding; naso-frontal region strongly dished; rostrum short, somewhat depressed and pugged; nasals rising anteriorly; nares small and subtruncate; sagittal crest long, reaching to halfway between fronto-parietal suture and plane of postorbitals; zygomatic arches moderately outstanding, narrow and slender, not expanded vertically; palate and postpalatal shelf short and broad; mastoids long and spreading. Underjaw long for size of skull; coronoid narrow above, the apex not reaching plane of condyle; teeth rather large for size of skull.

\* Estimated.

*Old female* (No. 205162) from *St. Clair River, Yukon*, collected Sept. 6, 1914, by A. Hoyt: Size very small; frontal shield remarkably broad for so small a skull, convex and medially sulcate interorbitally; fronto-nasal region strongly dishd; postorbitals small, outstanding; rostrum short and depressed; palate and postpalatal shelf short and broad; zygomata rather strongly outstanding, subtriangular. Lower jaw very small and light; coronoid moderate, apex strongly recurved; teeth very small, nearly as small as in *nelsoni*.

*Cranial comparisons.*—*Old male pallasi* (the type) compared with *old male kluane* (the type): Size decidedly smaller; skull about an inch shorter and much less highly arched, with conspicuously shorter braincase and shorter sagittal crest; crest nearly straight instead of strongly arched; postorbitals very much smaller, narrower, and less strongly decurved; fronto-nasal region much less elevated and more dishd; rostrum much lower, depressed above instead of rounded; palate much shorter, less arched and less concave; lower jaw much shorter; coronoid lower.

*Adult female pallasi* compared with *adult female kluane*: Size of skull essentially the same or slightly smaller; canines smaller; molars very much smaller.

*Skull measurements* (♂ old, type).—Basal length 302.5 mm.; occipito-nasal length 279; palatal length 159; zygomatic breadth 209; interorbital breadth 72.5.

#### ***Ursus selkirki* sp. nov.**

*Type* No. 205170 ♂ old, U. S. National Museum, Biological Survey Collection. From Upper Columbia River, Selkirk Mts., B. C. Collected June 4, 1914, by John Hurst.

*Characters.*—Size medium or rather small; skull long, low, flat, and narrow; naso-frontal region elevated, sloping in same plane with frontal shield; postorbitals broadly subtriangular.

*Cranial characters.*—Frontal shield narrow and flat, sloping gradually into rostrum, only faintly depressed interorbitally, rather long-pointed, ending posteriorly about 20 mm. in front of parietals; postorbital processes flat, very broad, concave anteriorly, convex posteriorly, not widely projecting; rostrum rather narrow, slightly rising posteriorly in frontal plane; nasals slightly elevated anteriorly; sagittal crest short; palate arched anteroposteriorly and concave transversely; postpalatal shelf broad and flat; zygomata moderately spreading, subtriangular; mastoids rather short; lower jaw rather weak; coronoid blade low, the apex abruptly recurved, defining a rather short coronoid notch.

*Cranial characters of old female*, assumed to be *selkirki*, No. 203162 female old, Wallowa Mts., Oregon. Collected May, 1909, by J. K. Carper and J. T. Jardine.—Size rather large in relation to male; cranium low and flat; frontal shield medium, flat (slightly depressed medially), the point ending at fronto-parietal suture; postorbitals large, rather broad, and horizontally outstanding; rostrum rather narrow, high, and short; zygomata subtriangular; postpalatal shelf broad and flat; ramus of jaw

nearly straight (inferior border); coronoid blade high, apex strongly recurved overreaching plane of condyle, defining coronoid notch. Canines small; molars (especially M<sup>2</sup>) rather large.

*Cranial comparisons* (old males).—Similar in general to *Ursus chelan* but smaller; vault of cranium much lower; frontal shield longer-pointed posteriorly; postorbital processes broader; sagittal crest much shorter and not elevated above general level of top of skull; zygomata less outstanding and more sharply triangular; lower jaw smaller and lighter; inferior border of ramus shorter, less bellied posteriorly; coronoid blade much lower and more abruptly recurved.

Compared with *latifrons*, whose range it approaches on the north, *selkirki* is easily distinguished by slightly smaller size, very much narrower and flatter frontal shield, broader postorbitals (strongly convex posteriorly), more elevated and evenly sloping fronto-nasal region; less outstanding and more triangular zygomata; longer squamoso-jugal suture; broader postpalatal shelf; much shorter lower jaw, much shorter and less upcurved inferior border of ramus, and much lower coronoid blade.

*Skull measurements* (♂ old, type).—Basal length 305 mm.; occipito-nasal length 306; palatal length 169; zygomatic breadth 206; interorbital breadth 74.

#### *Ursus townsendi* sp. nov.

*Type* No. 216643 ♂ old, U. S. National Museum. From mainland of southeastern Alaska; exact locality uncertain but probably between Cross Sound and Alsek River delta. Purchased at Sitka in 1889 by Dr. Charles H. Townsend.

*Cranial characters*.—Skull large, long, massive, rather low and flat-topped, dished, with extremely small teeth. Shield broad, flat, slightly depressed medially, the point ending anterior to parietals, sides reaching out broadly into very broad postorbitals, strongly sloping to rostrum; rostrum moderate, flat or depressed on top; nares truncate; zygomata moderately outstanding and moderately bowed; squamosal base broadly and abruptly expanded vertically; palate and postpalatal shelf moderate; notch rather narrow; mastoids long; occipito-sphenoid 95 mm.; basi-sphenoid rather deeply concave. Underjaw long; ramus broad and flat vertically; coronoid of moderate height, narrowing above, sloping strongly backward, apex cutting plane of posterior part of condyle; upper two-thirds of anterior border strongly inflected.

*Cranial comparisons*.—*Old male* (the type) compared with *male caurinus* (apparently its only near relative): Skull much larger, broader, more massive, and less arched; teeth smaller. Frontal shield very much broader interorbitally and postorbitally (interorbitally 91 contrasted with 81 or less; across postorbitals 130 contrasted with 116); postorbitals very much broader and flatter; rostrum more horizontal; nares truncate instead of sloping; zygomata more widely outstanding and more broadly expanded vertically.

*Skull measurements* (♂ old, type).—Basal length 348 mm.; occipito-



nasal length 353; palatal length 183; zygomatic breadth 245; interorbital breadth 91.5.

***Ursus washake* sp. nov.**

*Type* No. 213005 ♂ adult (rather old), U. S. National Museum, Biological Survey Collection. From North Fork Shoshone River, Absaroka Mts., western Wyoming (between Bighorn Basin and Yellowstone National Park). Killed September, 1913, by Col. J. A. McGuire.

*Cranial characters.*—Old male (the type): Size medium, about equaling male *shoshone* and male *horriaeus*; skull rather short and high, moderately arched, with broad, elevated postorbitals and rather broadly outbowed zygomata. Frontal shield rather narrow, sloping strongly upward anteriorly, highest at postorbital processes; horizontal posteriorly, broadly concave between postorbital processes; postorbital processes large, broad, subtriangular as viewed from above, outstanding, elevated and slightly arched, rising well above frontal plane and passing anteriorly into thickened orbital rims; fronto-nasal region dished (change of angle about middle of nasals); rostrum rather small, strongly compressed horizontally between nasals and roots of canines, making nasals appear elevated; anterior nares small; zygomata rather slender, broadly spreading, rounded and strongly outbowed posteriorly, only slightly expanded vertically; sagittal crest low; postpalatal shelf broad, flat, and rather short; occipito-sphenoid 87 mm. (=distance from front of canine to or slightly beyond middle of  $M^1$ ). Lower jaw moderate; ramus bellied posteriorly; coronoid blade high and rather falcate, the apex cutting plane of condyle (line from apex to tip of angular process passing well behind condyle). Teeth moderate or rather large;  $M^2$  large.

*Cranial comparisons.*—Old male *washake* (type) compared with adult male *shoshone* of same region: Size essentially same, but general appearance of skull very different; braincase broadly and rather flatly depressed anteriorly instead of narrowing to keeled crest; frontal shield more abruptly uplifted anteriorly, highest at postorbital processes [in *shoshone* rising gradually and highest midway between postorbitals and parietals]; postorbital processes large, massive, subtriangular, elevated and somewhat arched [in *shoshone* slender, peglike, and somewhat depressed]; rostrum more compressed horizontally below nasals; zygomata much more broadly outstanding; postpalatal shelf broader; angular process of lower jaw longer and more produced.

Compared with adult male *ophrus* from eastern British Columbia (the type): Size about the same but appearing smaller; frontal shield less elevated and less deeply concave; fronto-nasal region elevated instead of sulcate-dished; zygomata less widely outbowed; postorbitals much broader and less elevated; orbital rims less swollen; postpalatal shelf shorter and broader; mastoids shorter; nares smaller and lower. Lower jaw more massive; inferior border of ramus more swollen and much more bellied posteriorly; coronoid blade higher and more falcate, the apex reaching much farther posteriorly (cutting plane of hinder part of condyle).

*Compared with old male selkirki* from Selkirk Range, southeastern British Columbia (the type): Size somewhat greater; agreeing in great breadth of postorbital processes, but differing as follows: fronto-nasal region more dished; frontals rising more abruptly at orbits; frontal shield concave between postorbital processes; postorbitals elevated; upper part of orbital rim swollen and elevated; nasals more flattened and much more strongly dished; zygomata more broadly outbowed and more arched; coronoid blade much higher.

*Compared with adult male canadensis* from Moose Pass, eastern B. C. (No. 174511, the type) with which it agrees essentially in basal and occipito-sphenoid length: frontal shield less flat, more elevated laterally, highest at postorbitals instead of at posterior point; fronto-nasal region more dished; rostrum smaller, narrower basally, more strongly compressed below nasals; postorbital processes very much larger, broader, and more massive, elevated, arched and subtriangular, instead of slender and narrowly peglike; zygomata more outbowed and arched; sagittal crest low and straight instead of high and arched; inion less developed; braincase anteriorly broader and more depressed—not tending to ‘keel’ into sagittal crest as in *canadensis*; occipito-nasal length less, although basal length of skull is essentially the same in both. Lower jaw longer; inferior border of ramus shorter and more strongly bellied; coronoid blade higher and more falcate, its apex reaching farther posteriorly; distance from angle to subangular process much greater; diastema in both jaws much longer. Last upper and middle lower molars not quite so broad.

*Compared with adult male absarokus* from north end Bighorn Mts., eastern Montana (No. 67391, the type): Size smaller; vault of cranium decidedly lower; braincase anteriorly broadly depressed; frontal shield narrower, lower and flatter, concave instead of convex between postorbital processes; postorbital processes (viewed from above) *broadly triangular, uplifted and somewhat arched* instead of peg-shape; orbital rims more thickened and elevated; rostrum smaller, lower, more slender, and much more compressed horizontally between nasals and roots of canines, making the nasals appear elevated; sagittal crest lower; occipito-sphenoid shorter; occiput lower; anterior nares smaller. Lower jaw shorter; inferior border of ramus much shorter; coronoid blade more falcate, its apex reaching farther posteriorly; angular process more slender and more produced posteriorly (line connecting apex of coronoid with angle passing well behind condyle—in *absarokus* cutting condyle near middle). Molars smaller.

*Compared with old male horriaeus* from New Mexico (the type) with which it agrees in size, proportions, and general characters: Frontal shield rising more strongly anteriorly, highest at postorbitals [in *horriaeus* highest at point], longer pointed; postorbital processes broader at base and more definitely *triangular* as seen from above; fronto-nasal region more dished; sides of rostrum more compressed horizontally below nasals; skull broader across squamosals; squamosal shelf longer antero-posteriorly, its outer free edge straighter (less incurved); zygomata more

widely outstanding and less angular; squamosal arm less expanded vertically; palate and postpalatal shelf broader and flatter; sagittal crest shorter and less highly developed; inion shorter. Teeth somewhat larger.

*Skull measurements* ( $\sigma$  ad. type).—Basal length 310 mm.; occipitonasal length 305; palatal length 170; zygomatic breadth 217; interorbital breadth 76.